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| 09/520,257 | 03/07/2000 | Mark R. Bilak | BUR990238US1 | 1284 |

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EXAMINER

DAY, HERNG DER

| ART UNIT | PAPER NUMBER |
|----------|--------------|
| 2128 | |

DATE MAILED: 05/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/520,257

Applicant(s)

BILAK ET AL.

Examiner

Herng-der Day

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. This communication is in response to Applicants' Amendment (paper # 5) to Office Action dated September 11, 2003 (paper # 3), mailed February 11, 2004.

1-1. Claims 2-4, 6, 12-13, 16, 20, and 27 have been amended; claims 1-27 are pending.

1-2. Claims 1-27 have been examined and claims 1-27 have been rejected.

Priority

2. It is noted that the inventors shown in this instant application (09/520,257) are not identical as shown in the provisional application (60/172,198). In paper # 5, Applicants acknowledge, "there are different inventors of this application versus the original provisional application" because "When the final set of claims was created another review of inventorship occurred and another inventor identified". Applicants have clarified the issue of inventorship.

Applicants' intention to claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the information provided in the Supplemental Application Data Sheet (Appendix I, paper # 5) is incorrect. The claimed domestic priority for this instant application (09/520,257) should be the provisional application (60/172,198), filed December 17, 1999.

Drawings

3. The new set of formal drawing, filed February 11, 2004, have been disapproved because they introduce new matter and errors into the drawings. 37 CFR 1.121(f) states that no amendment may introduce new matter into the disclosure of an application. For example, no

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evidence in the original disclosure supports the amended "Fall Rate" from the original "Fail Rate" in FIG. 6. Applicants should carefully review all the formal drawings and correct all the informalities. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application.

3-1. For example, the drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because in FIG. 8, (a) reference character "10" has been used to designate both "RAM" and "CPU"; (b) reference characters "10" and "14" have both been used to designate "RAM".

3-2. For example, the drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the newly added step 56 in FIG. 4.

Specification

4. The objection to the specification has been withdrawn.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-27 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

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There is a substantial lack of teachings for the claimed invention. For example, as described in lines 19-20 of page 5 in the specification, "One guardband value is determined by combining the individual values and then adding hot-e input based on performance sort". However, how to "combine the individual values and then add hot-e input based on performance sort" has not been described in the specification. Therefore, without undue experimentation, it is difficult for one skilled in the art to make and/or use the invention.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 2-3, 12-13, 15-17, and 20-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8-1. Claim 2 recites the limitation "the product" in line 2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8-2. Claim 16 recites the limitation "the step of calculating the tester to system mean and sigma" in lines 1-2 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8-3. Claim 20 recites the limitation "the product under test" in line 5 of the claim. There is insufficient antecedent basis for this limitation in the claim.

8-4. Claims not specifically rejected above are rejected as being dependent on a rejected claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1-4, 6-7, 10, 20-24, and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Mittl et al., U.S. Patent 5,634,001 issued May 27, 1997.

10-1. Regarding claim 1, Mittl et al. disclose a method for determining a specification guardband comprising the steps of:

creating a set of distribution models representative of variables that affect said specification (histograms, column 6, lines 1-6);

analyzing the set of models with a statistical tool that can work with the distribution models (difference between times, column 6, lines 24-31); and

selecting a guardband for said specification based on the statistical analysis and a tolerance target for the said specification under analysis (determine the appropriate guard-band, column 6, lines 45-60).

10-2. Regarding claim 2, Mittl et al. further disclose one of the variables is a system on which the product is used (the system environment factors, column 5, lines 14-16).

10-3. Regarding claim 3, Mittl et al. further disclose one of the variables is a system to tester offset (the difference, column 5, lines 57-63).

10-4. Regarding claim 4, Mittl et al. further disclose one of the variables is a test system which the guardband is used (timing measurements due to hot-electron effects, column 5, lines 37-44).

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10-5. Regarding claim 6, Mittl et al. further disclose the specification is maximum frequency (minimum value of t_{cycle} , column 3, lines 56-62; maximum frequency is the inverse of minimum t_{cycle}).

10-6. Regarding claim 7, Mittl et al. further disclose a sample chosen for creating the models is at least 10 (the number of circuit paths in a microprocessor, column 6, lines 3-6; is at least 10).

10-7. Regarding claim 10, Mittl et al. further disclose one of the set of models is a reliability wearout model (hot-electron reliability tool is used, column 5, lines 37-44).

10-8. Regarding claims 20-24, these program storage device claims include equivalent method limitations as in claims 1-4 and 10 and are anticipated using the same analysis of claims 1-4 and 10.

10-9. Regarding claim 27, Mittl et al. disclose a computer configured for determining a tester guardband, the computer comprising:

an application interface for inputting various environmental models into the computer the models comprising a tester model and system model (histograms, column 6, lines 1-6);

a memory that contains a statistical program capable of doing statistical distribution analysis (software program, column 5, lines, 63-67);

an application interface for inputting tolerance data (FIG. 5);

an execution unit that receives the statistical program and environmental models and processes the guardbands based on the tolerance data (determine the appropriate guard-band, column 6, lines 45-60); and

an I/O device for outputting the guardband data (guard band output files 44, FIG. 3).

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11. Claims 1 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Comard et al., "Calculating Error of Measurement on High Speed Microprocessor Test", Proceedings of International Test Conference, October 1994, pages 793-801.

11-1. Regarding claim 1, Comard et al. disclose a method for determining a specification guardband comprising the steps of:

creating a set of distribution models representative of variables that affect said specification (Figures 2 and 3, page 794);

analyzing the set of models with a statistical tool that can work with the distribution models (analysis of means, page 794, column 2 through page 798, column 2); and

selecting a guardband for said specification based on the statistical analysis and a tolerance target for the said specification under analysis (Table 1 and 2, page 798).

11-2. Regarding claim 8, Comard et al. further disclose the tolerance target is a quality target (Scrap Risk, page 798, Table 1).

11-3. Regarding claim 9, Comard et al. further disclose the tolerance target is a revenue target (Down Bin Risk, page 798, Table 2).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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13. Claims 5 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mittl et al., U.S. Patent 5,634,001 issued May 27, 1997, as applied to claims 1 and 20, and further in view of Applicants' assertions.

13-1. Regarding claim 5, Mittl et al. fail to expressly disclose the statistical tool uses a Monte Carlo analysis.

However, Applicants assert, as described in line 29 of page 5 in the specification, "any statistical software program can be used with the invention". It is well known that Monte Carlo method is a technique, which obtains a probabilistic approximation to the solution of a problem by using statistical sampling techniques and most statistical software programs include Monte Carlo analysis.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Mittl et al. to incorporate the Monte Carlo analysis of a statistical software program asserted by the Applicants to obtain the invention as specified in claim 5 because a probabilistic approximation to the solution of a problem can be easily obtained by using Monte Carlo analysis.

13-2. Claim 25 is a program storage device claim including equivalent method limitations as in claim 5 and is unpatentable using the same analysis of claim 5.

14. Claims 11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mittl et al., U.S. Patent 5,634,001 issued May 27, 1997, as applied to claims 1 and 20, and further in view of Kreyszig, "Advanced Engineering Mathematics", John Wiley & Sons, 1988, pages 1248-1253.

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14-1. Regarding claim 11, Mittl et al. fail to expressly disclose student-t and chi-squared distribution models are used.

Kreyszig discloses student-t distribution is used for determination of a confidence interval for the mean of a normal distribution with unknown variance (table 24.6, page 1251) and chi-squared distribution is used for determination of a confidence interval for the variance of a normal distribution, whose mean need not be known (table 24.7, page 1252).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Mittl et al. to incorporate the teachings of Kreyszig to obtain the invention as specified in claim 11 because student-t and chi-squared distribution models are designed to determine a confidence interval for the mean and variance of a normal distribution.

14-2. Claim 26 is a program storage device claim including equivalent method limitations as in claim 11 and is unpatentable using the same analysis of claim 11.

Allowable Subject Matter

15. Dependent claims 12-19 are non-obvious over the prior art of record, and would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, first and/or second paragraph, set forth in this Office action and rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicants' Arguments

16. Applicants argue the following:

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16-1. Claim rejections - 35 U.S.C. 112, 1st Paragraph

(1) “Page 5, lines 17-21, teaches selecting one guardband value from each model for each iteration of the Monte Carlo analysis and then adding a hot-e guardband which corresponds to performance sort” ([7], paper # 5).

(2) “Steps 160, 170, 180 and 190 of Figure 7 illustrate a typical Monte Carlo analysis” and “the Monte Carlo analysis itself is well known” ([7], paper # 5).

16-2. Claim rejections - 35 U.S.C. 112, 2nd Paragraph

(3) “The Applicants have amended the claims to overcome the Examiner’s rejections” ([9], paper # 5).

16-3. Claim rejections - 35 U.S.C. 102

(4) “Mittle does not teach ‘creating a set of distribution models representative of variables’ in claim 1” ([11-1, 2], paper # 5).

(5) “Mittle fails to teach or suggest modeling of system voltage and temperature variables (claim 2)” ([11-1, 2], paper # 5).

(6) “there is no teaching of a variable for ‘system to tester offset’ as set forth in claim 3” ([11-3], paper # 5).

(7) “there is no teaching of using the ‘test system’ as a variable (claim 4)” ([11-4], paper # 5).

(8) Mittle does not teach or suggest the claimed invention ([11-5]-[11-9], paper # 5).

(9) Conrad does not teach or suggest the claimed invention ([12-1]-[12-10], paper # 5).

16-4. Claim rejections - 35 U.S.C. 103

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(10) "The techniques taught in Mittle have no use for a statistical sampling technique like that taught and claimed by Applicants" ([14-1], paper # 5).

(11) "The combinations cited by the examiner fail to suggest three of the novel aspects of the present invention" ([15, 17], paper # 5).

Response to Arguments

17. Applicants' arguments have been fully considered.

17-1. Applicants' argument (1) is not persuasive because "how to combine the individual values" has not been provided.

17-2. Applicants' argument (2) is not persuasive. "Steps 160, 170, 180 and 190 of Figure 7" only randomly select one value from each distribution and store data. Although the Monte Carlo analysis itself is well known, Figure 7 does not appear to have illustrated a typical Monte Carlo analysis.

17-3. Response to Applicants' argument (3). The original claim rejections under 35 U.S.C. 112, second paragraph, in sections 9-2 to 9-6 of paper # 3 for indefiniteness have been withdrawn. Claims 2-3, 12-13, 15-17, and 20-26 are rejected under 35 U.S.C. 112, second paragraph, as detailed in sections 8-1 to 8-4 above.

17-4. Response to Applicants' argument (4). Mittl et al. disclose, "The histograms are graphical representations of a frequency distribution" (column 6, lines 1-6), which are distribution models representative of variables.

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17-5. Response to Applicants' argument (5). Mittl et al. disclose, "the system environment factors of power supply voltage, case temperature, and lifetime are included in the calculations" (column 5, lines 14-16), which models system voltage and temperature variables.

17-6. Response to Applicants' arguments (6) and (7). Mittl et al. disclose using different tools to create input file 40 and input file 38, then, using analysis tool 36 to compile histograms, which are graphical representations of a frequency distribution. In other words, input files store information of variables that affect the guardband.

17-7. Applicants' argument (8) is not persuasive. For example, Mittl et al. have disclosed maximum frequency and reliability wearout model. Besides, interface for inputting is inherent for a computer to be useful and controllable.

17-8. Response to Applicants' argument (9). Comard et al. have disclosed using scrap risk and down bin risk for determining guardband, which are related to quality and revenue respectively. Applicants' arguments regarding Comard et al. other than claims 3 and 8-9 are moot because the Examiner has withdrawn the rejections based on the prior art of Comard et al.

17-9. In response to Applicant's argument (10) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

17-10. Applicants' argument (11) is not persuasive because Mittl et al. have disclosed the related limitations as detailed in section 10-1 above.

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Conclusion

18. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

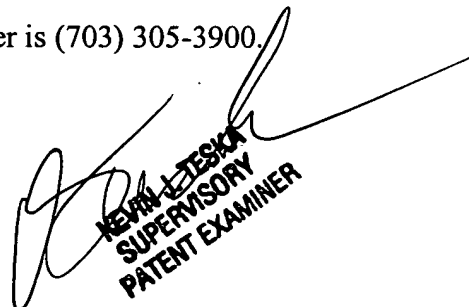
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

19. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (703) 305-5269. The Examiner can normally be reached on 9:00 - 17:30.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kevin J Teska can be reached on (703) 305-9704. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Herng-der Day
May 3, 2004


KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER